8908-15-35

NUS CORPORATION
A Halliburton Company

SDMS DocID 2205031

[redacted]

Correspondence related to Retention Basin and Deuce Pond Hydrogeologic assessment

FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

NUS CORPORATION
SUPERFUND DIVISION

HYDROGEOLOGIC ASSESSMENT
FMC, BALTIMORE

ORIGINAL (Red)

- SITE HISTORY
- HYDROGEOLOGY AND GROUNDWATER QUALITY
- POTENTIAL ENVIRONMENTAL IMPACT
- SUMMARY AND CONCLUSIONS

SITE HISTORY

1915 ETHANOL BASED CHEMICAL MANUFACTURING BEGUN

1925* MOLASSES SLOP STORAGE IN HOLDING POND

1945* LANDFILLING BEGUN IN HOLDING POND

1946 RESEARCH FACILITIES CONSTRUCTED

1954 FMC PURCHASES PROPERTY

1973 RESEARCH FACILITIES DEMOLISHED

1975 ON-SITE LANDFILLING CEASED

1977 STORMWATER RETENTION BASIN CONSTRUCTED

1982 GROUNDWATER MONITORING PROGRAM BEGUN

* - APPROXIMATE

ORIGINAL
(Red)

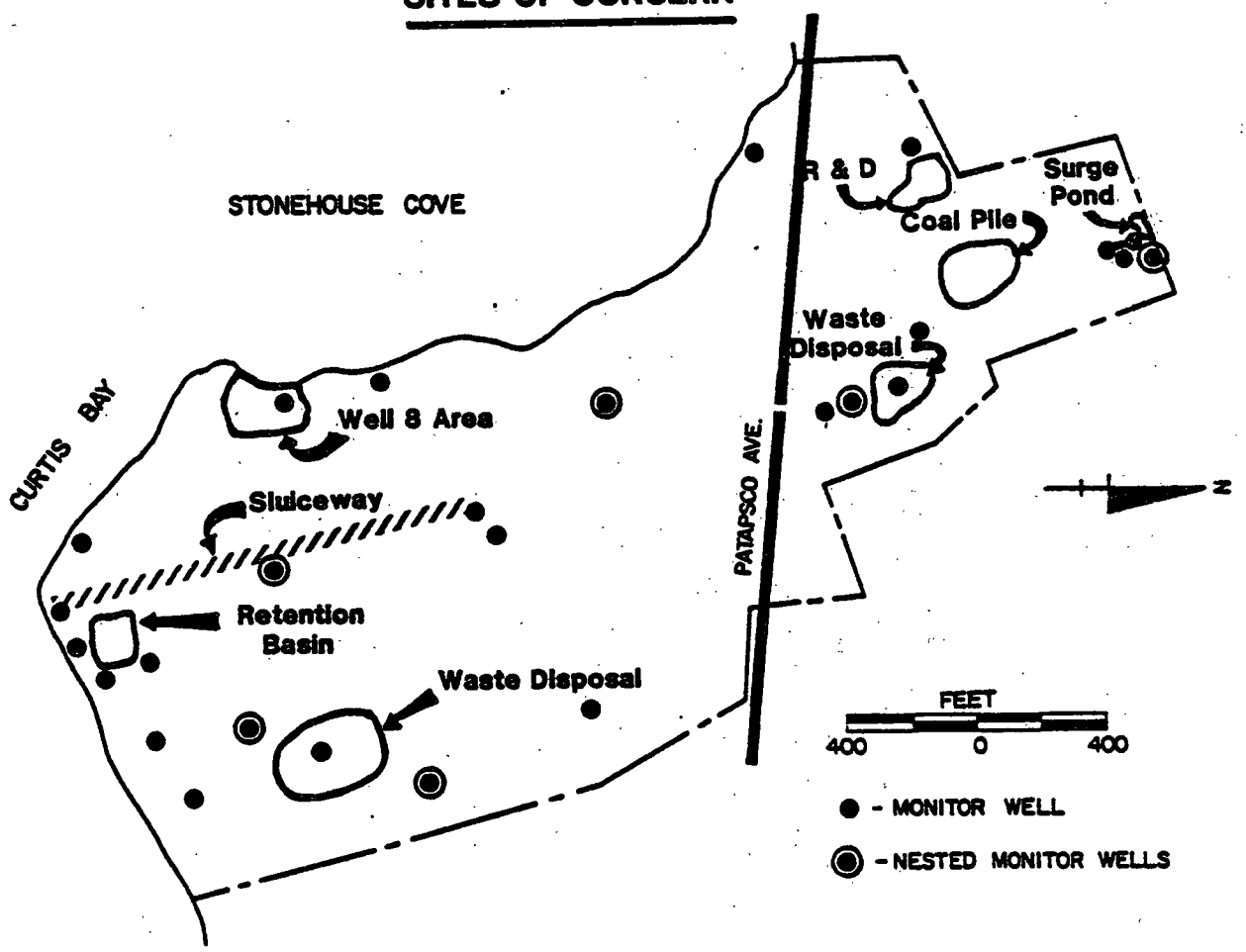
REPORTED ON SITE DISPOSAL

MATERIAL

- ACETOACETARYLIDES DRYER SCRAP
- CARBAMATE RESIDUES
- PYRETHRUM FLOWER RESIDUES
- PILOT PLANT WASTES
- 7-HYDROXY TAR
- 7-NITRO CENTRIFUGE BOTTOMS
- ETHION FILTER AIDS AND FILTER TUBES
- BUTACIDE TAR
- DAPON GEL AND POLYMERIZED MONOMERS
- GENERAL TRASH AND DEBRIS

ORIGINAL
(Red)

SITES OF CONCERN



ORIGINAL
(Red)

CONCLUSIONS

1. FMC SITE IN RECHARGE ZONE OF PATAPSCO AQUIFER.

   REGIONAL FLOW TO THE SOUTH EAST .

CONCLUSIONS

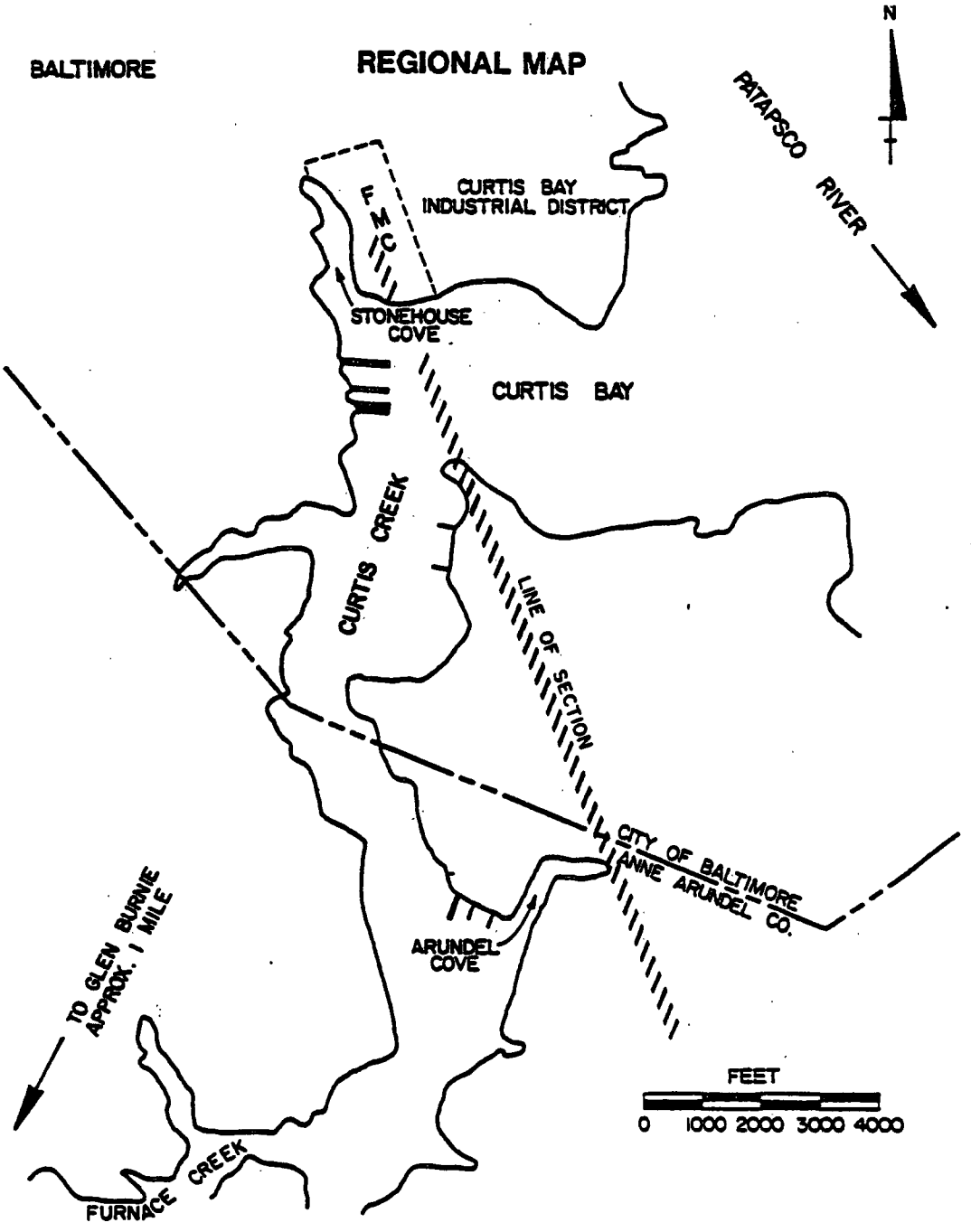
2. LOCAL HYDROGEOLOGY :

   DISCONTINUOUS LAYERS - FINE & COARSE SEDIMENTS.

   LOCAL CLAY AQUITARD RETARDS VERTICAL FLOW.

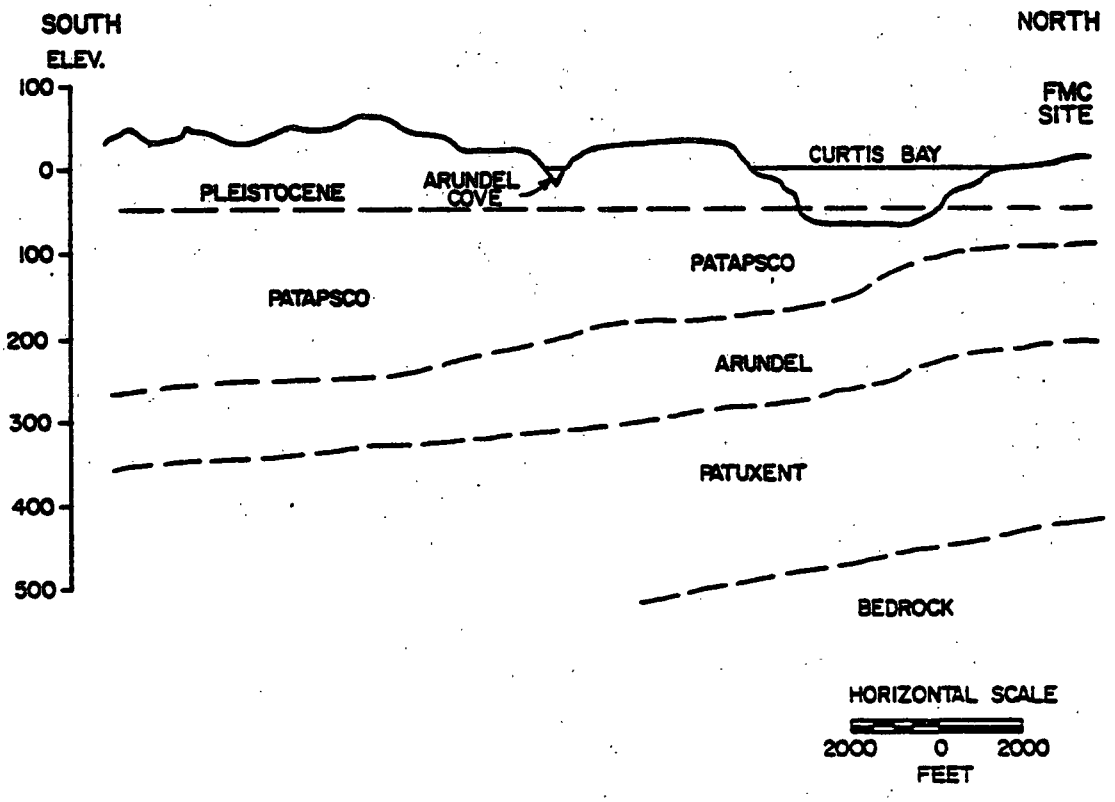
   BEHAVE AS SINGLE HYDRAULIC UNIT

ORIGINAL
(Red)



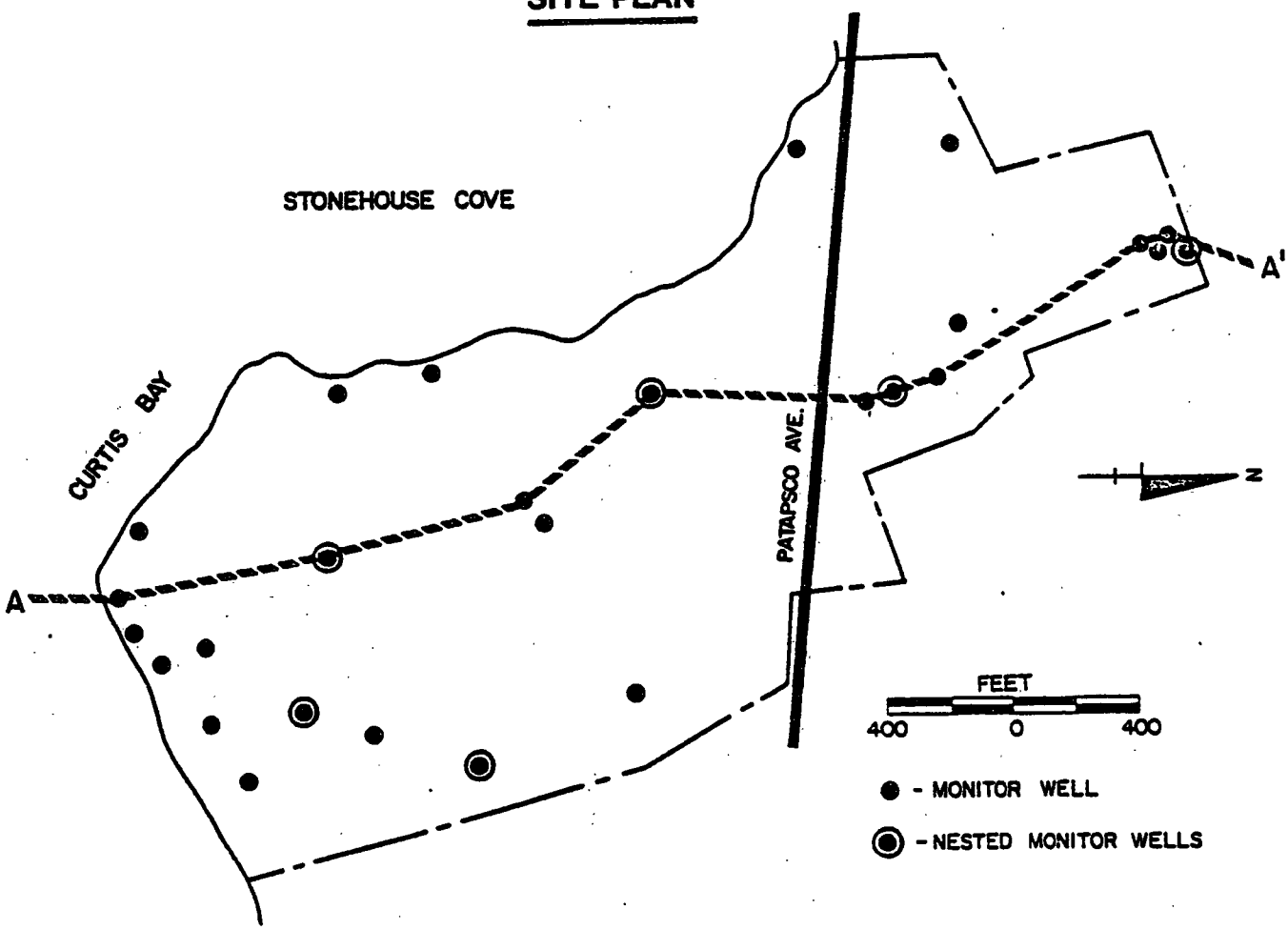
ORIGINAL
(Red)

REGIONAL GEOLOGIC CROSS SECTION



ORIGINAL
(Red)

SITE PLAN



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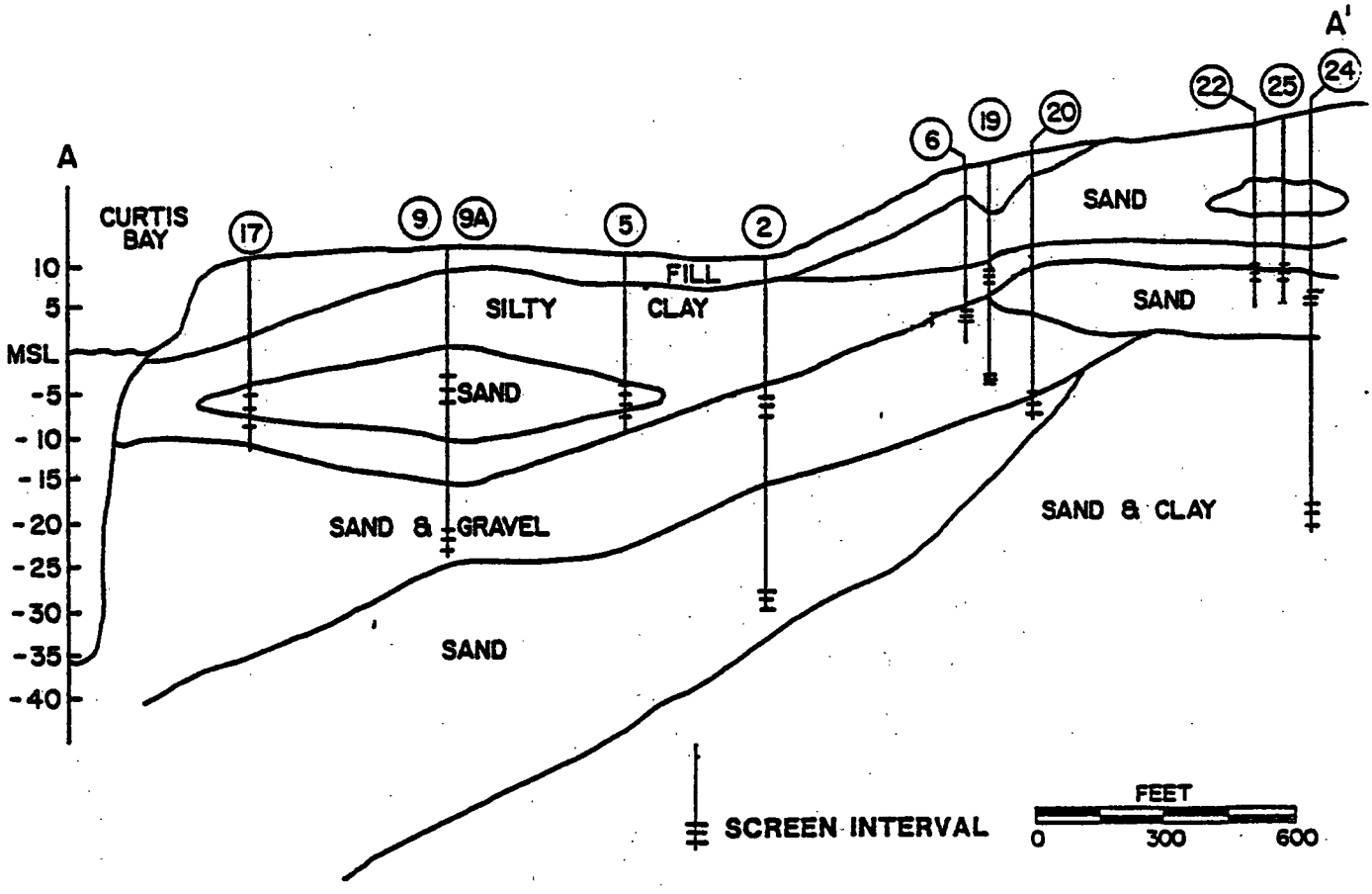
SITE LITHOLOGIC CROSS SECTION



ORIGINAL (Red)

CONCLUSIONS

3.,4.,5. SHALLOW GROUNDWATER DISCHARGES TO CURTIS BAY AND STONEHOUSE COVE

CLAY LENSES, etc. MAY AFFECT LOCAL FLOW DIRECTIONS

FRENCH DRAINS ROUTE SOME GROUNDWATERS TO SRB.

DEEPER PORTION OF PATAPSCO MAY UNDERFLOW SURFACE WATERS

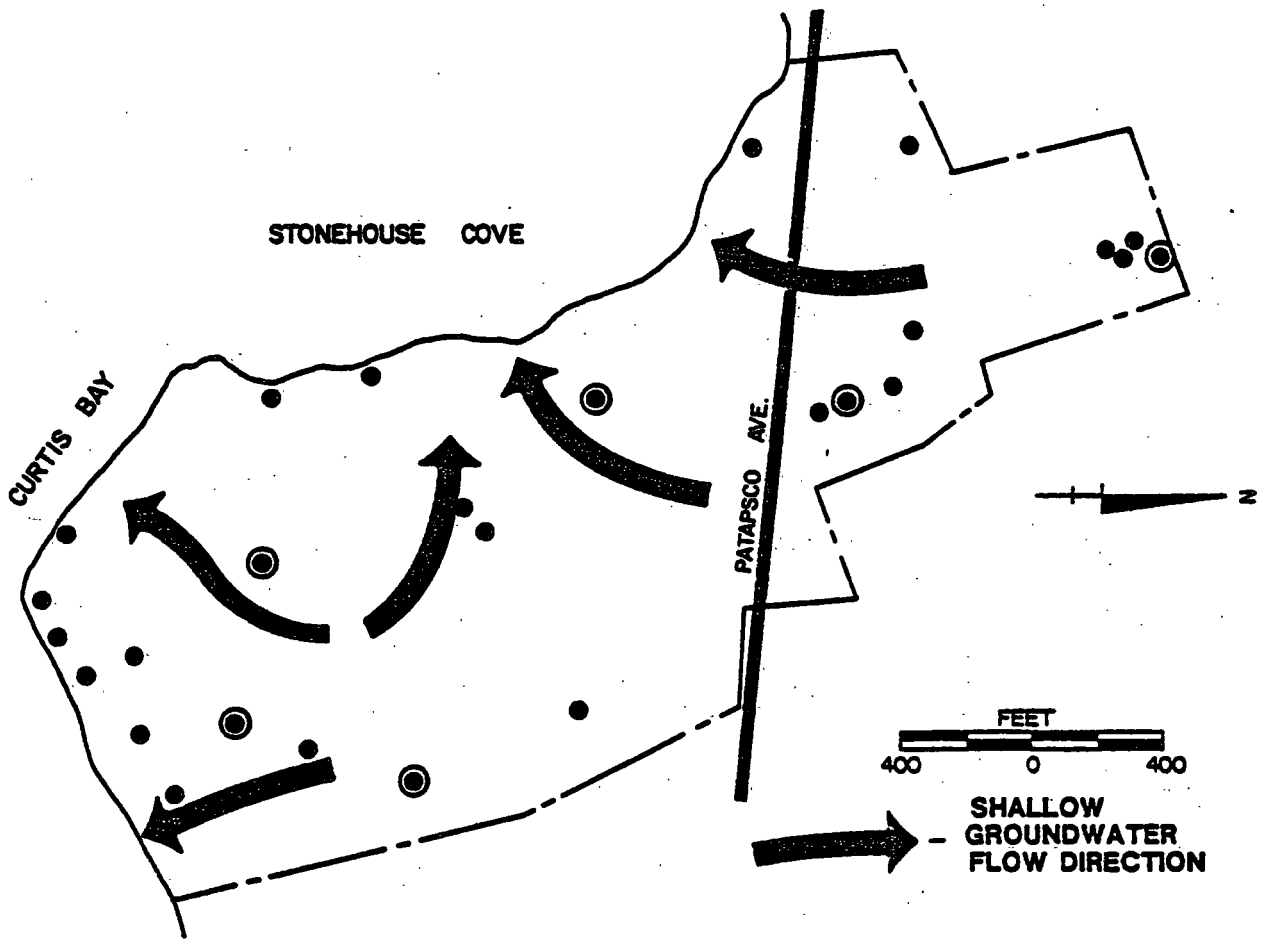
CONCLUSIONS

6. SOME CONTAMINANTS DERIVE FROM UPGRADIENT SOURCES

NO KNOWN ADJACENT USES OF PATAPSCO GROUNDWATER

ORIGINAL
(Red)

GROUNDWATER FLOW MAP



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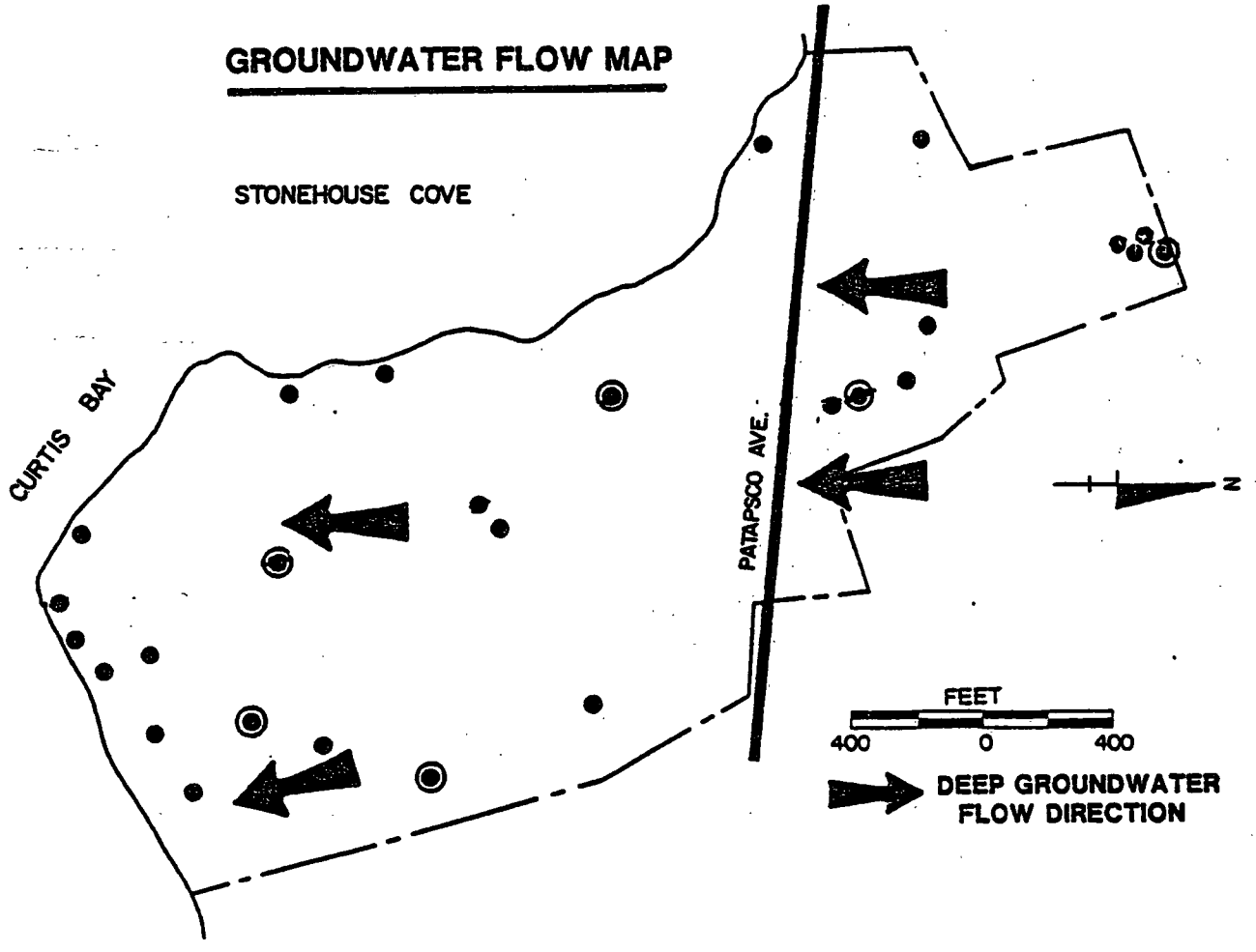
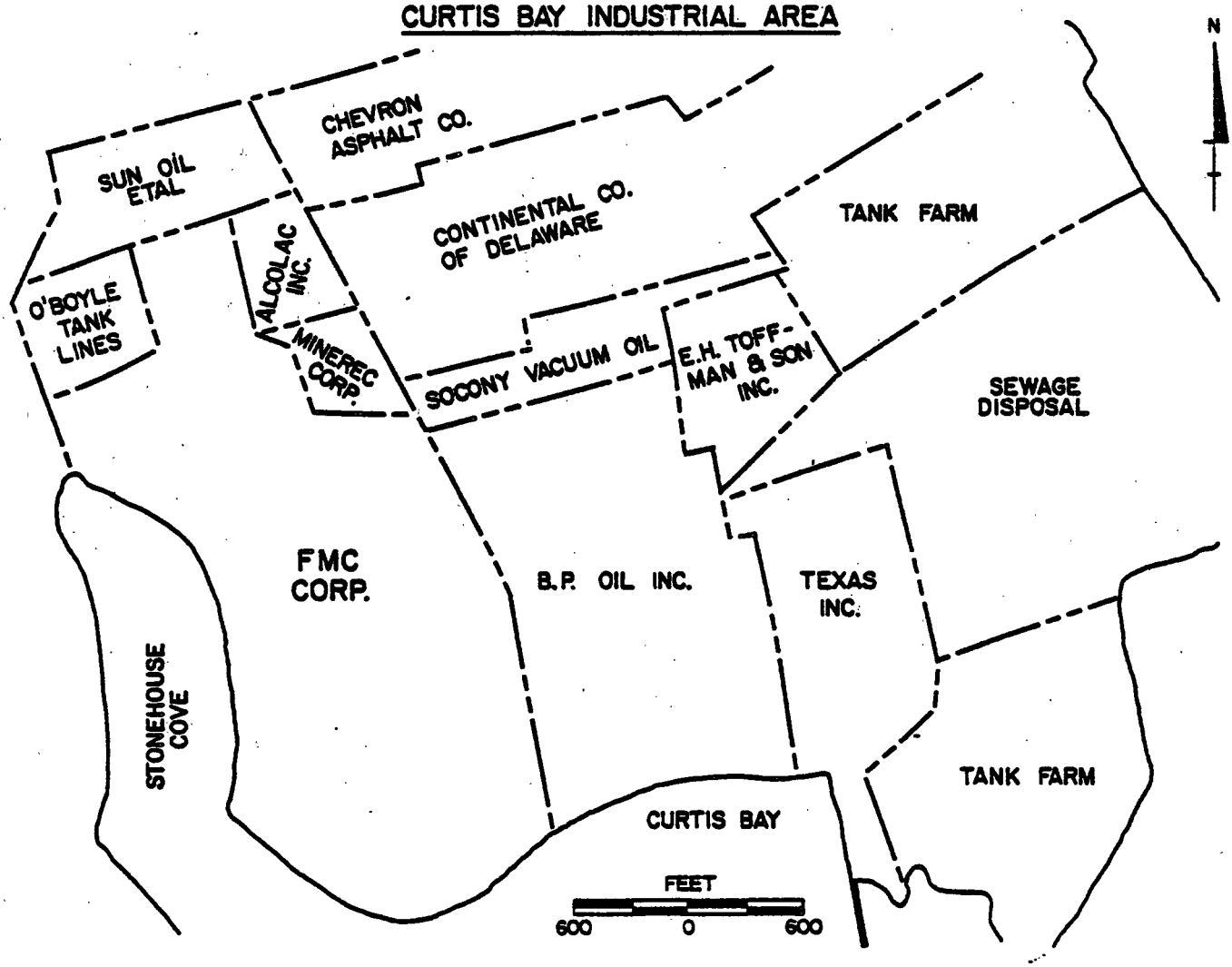


CURTIS BAY INDUSTRIAL AREA



CONCLUSIONS

7. AREAS OF POTENTIAL IMPACT

ORIGINAL (Red)

- SURGE POND
- COAL PILE
- DISPOSAL SITE II
- WELL 8 AREA

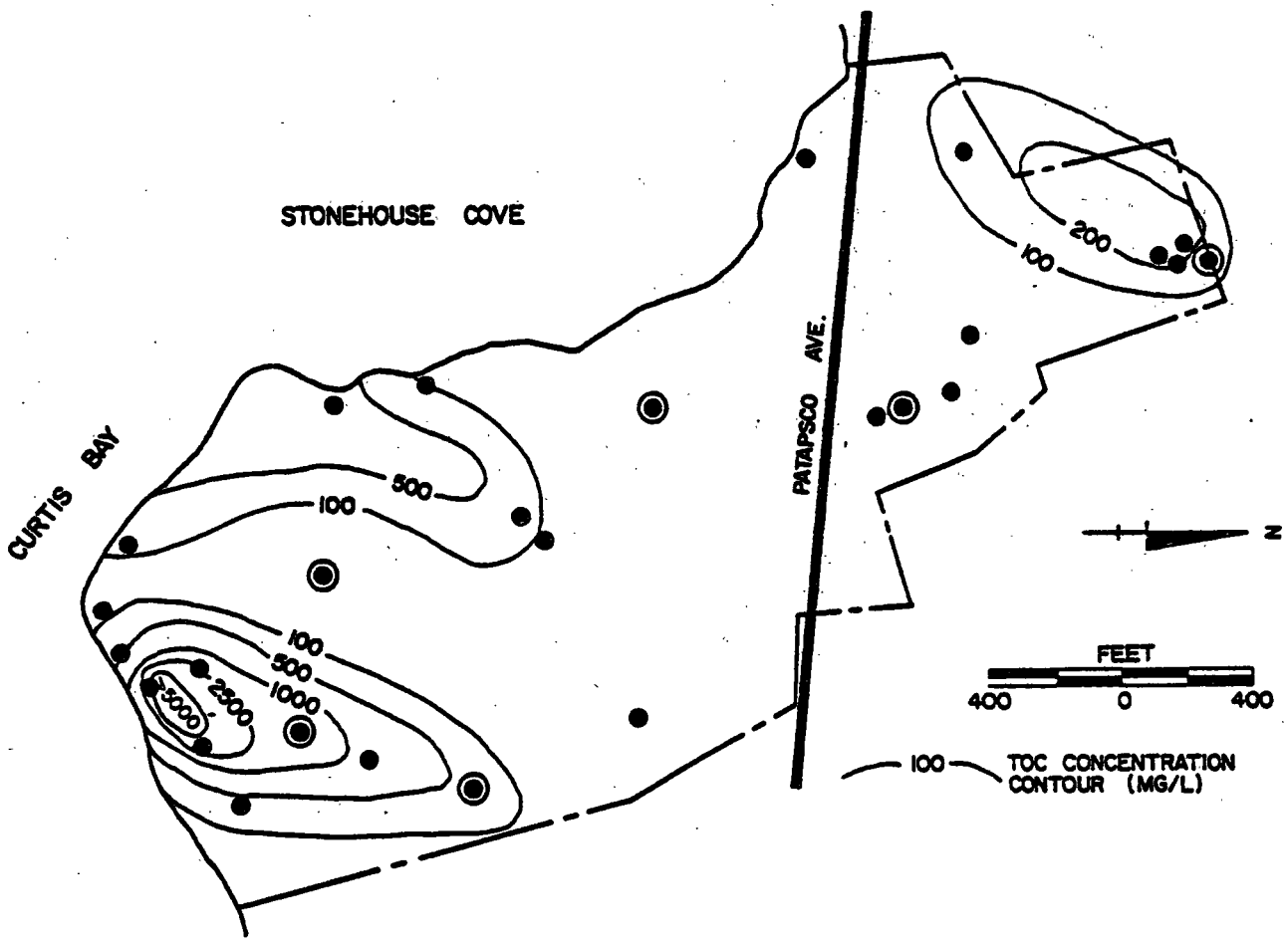
CONCLUSIONS

8. AREAS OF QUESTIONABLE IMPACT

- RETENTION BASIN
- R & D AREA

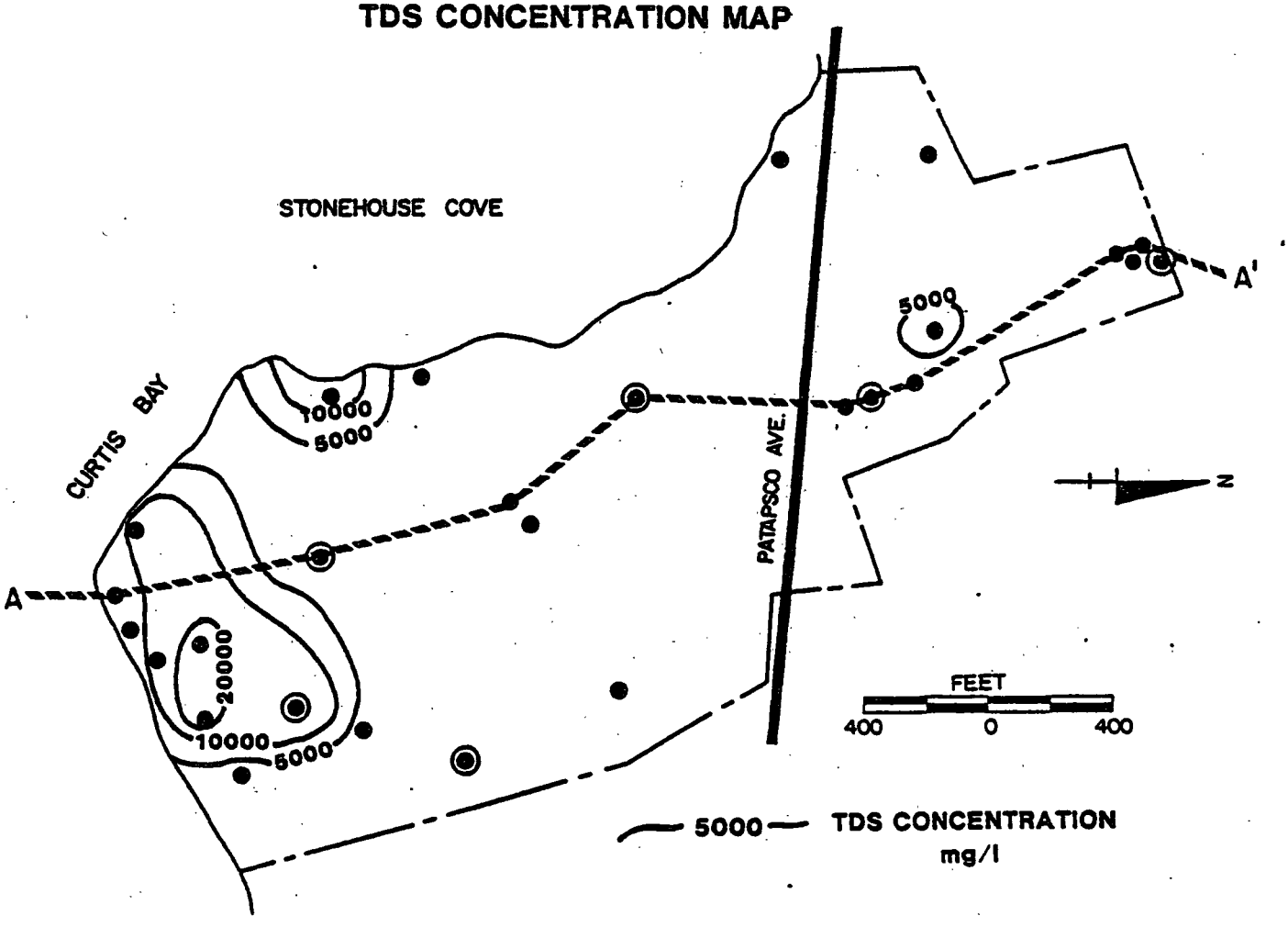
ORIGINAL
(Red)

GENERALIZED TOC CONCENTRATION MAP



ORIGINAL
(Red)

TDS CONCENTRATION MAP



ORIGINAL (Red)

CONCLUSIONS

9. AREAS OF UNLIKELY IMPACT

- DISPOSAL SITE I
- SLUICEWAY

CONCLUSIONS

10. SOME CONTAMINANTS HAVE MOVED TO UPPER PORTION OF PATAPSCO

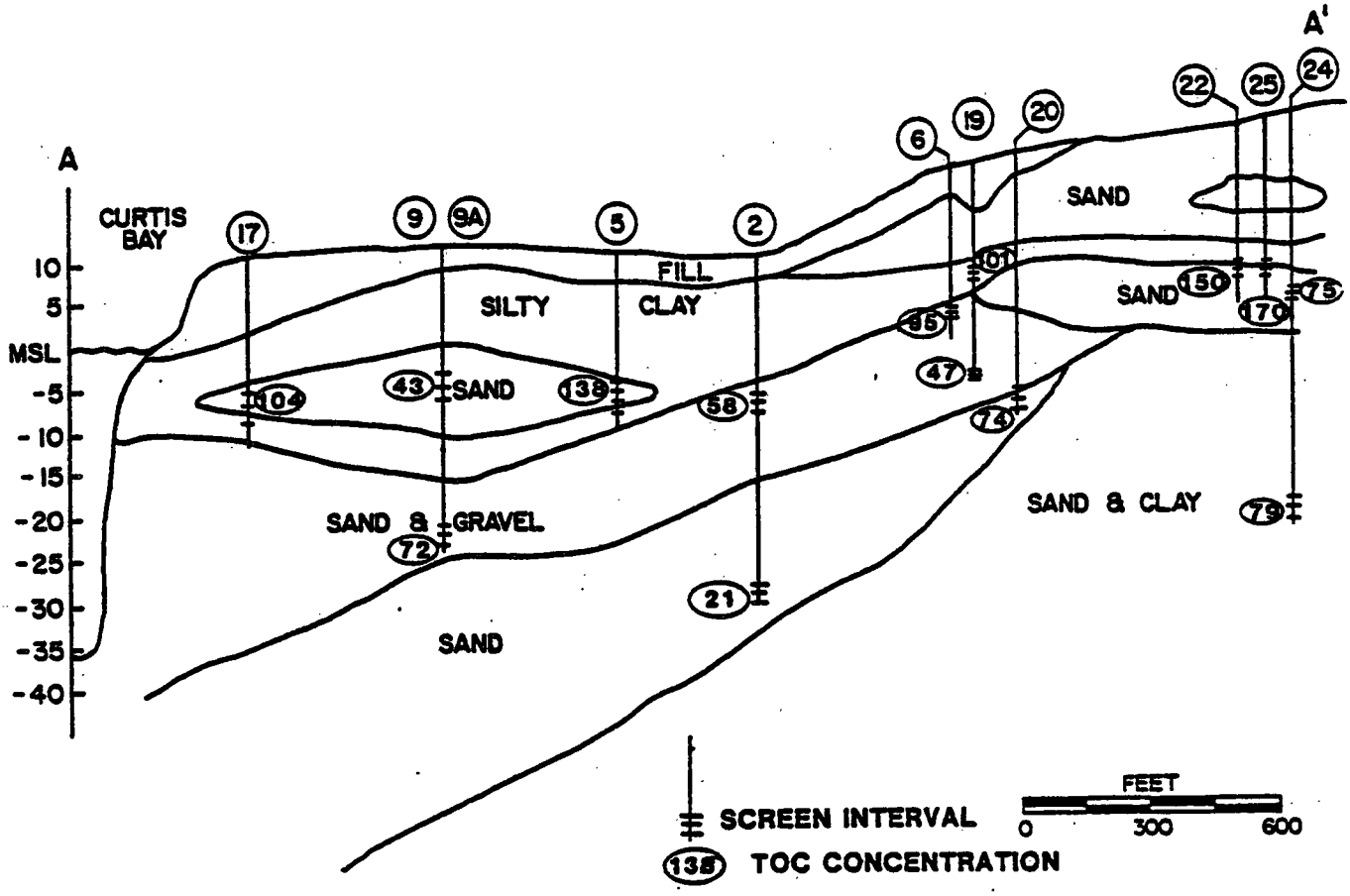
CONCLUSIONS

11. IMPACTS TO SURFACE WATER:

INORGANICS - UNLIKELY
ORGANICS - POTENTIAL

ORIGINAL
(Red)

SITE LITHOLOGIC CROSS SECTION



ORIGINAL (Red)

CONCLUSIONS

12. ANALYSES CONDUCTED DO NOT CHARACTERIZE THE ORGANICS

CONCLUSIONS

13. CURTIS BAY USES:

- COMMERCIAL SHIPPING
- CONTACT RECREATION
- RECREATIONAL FISHING

CONCLUSIONS

14. BOTH PATAPSCO AND PATUXENT AQUIFERS USED AS WATER SUPPLIES SOUTH OF FMC

ORIGINAL
(Red)

DEVELOPMENT OF
SITE REMEDIAL ACTION PLAN

1- WASTE CHARACTERIZATION

2- HYDROGEOLOGIC INVESTIGATIONS

3- RISK ASSESSMENT

4- COST - EFFECTIVENESS STUDIES

5- REMEDIAL ACTION PLAN

TASK ONE
GROUNDWATER CHARACTERIZATION

1.01 ANALYZE NEW PERIMETER MONITORING WELLS

1.02 ANALYZE TEMPORAL TRENDS

1.03 DETERMINE GROUNDWATER CHARACTERISTICS

1.04 ANALYZE SITE - SPECIFIC COMPOUNDS

ORIGINAL (Red)

RECEIVED
JAN 24 1984
ENFORCEMENT DIVISION

January 19, 1984

Mr. Darryl Palmer
FMC Corporation
1701 East Patapsco Avenue
Box 1616
Baltimore, Maryland 21203

Dear Mr. Palmer:

Members of my staff have recently completed a review of groundwater quality data pertaining to the Inactive Disposal Site. Analytical data developed by both the State and FMC document the presence of numerous compounds downgradient from the site including trichloroethene, toluene, benzene compounds and acetoacetarylide intermediates. The acetoacetarylide intermediates detected downgradient from the site were: aniline, and methyl and chloro substituted aniline compounds. The presence of these chemically unique compounds downgradient from the site "fingerprint" the acetoacetarylide dryer scrap known to have been disposed in the Inactive Disposal Site. In addition, GC/MS analytical results performed by the department indicate that at least 400 different compounds were detected in the closest downgradient well (MW13). Though the majority of these 400 compounds were not identifiable, the presence of such a large number of compounds immediately downgradient from the site also tends to support the conclusion that the Inactive Disposal Site is a likely source of contamination. Though the site has been monitored since the first quarter of 1982, no specific trends in water quality improvement can be discerned when the eight quarters of monitoring well data is examined. Consequently, the Waste Management Administration (WMA) requires FMC to close the Inactive Disposal Site pursuant to the closure standards of COMAR 10.51.05.07. Closure must be performed with a major emphasis on minimizing the post-closure escape of hazardous waste constituents to the groundwater. In order to facilitate the proper closure of the site the WMA hereby requests that FMC submit a proposal in 90 days to address the closure and post-closure of the Inactive Disposal Site. The proposed plan must address the requirements of COMAR 10.51.05.07 and 10.51.05.14D.

ORIGINAL
(Red)

If you have any questions or comments concerning the technical issues of this correspondence please contact Mr. Lou Martino of my staff at (301) 383-5734.

Sincerely,

William E. Chicca, Administrator
Technical Services Program

WEC:gmk

cc: Mr. Ronald Nelson
[redacted]
Mr. Louis Martino

FMC Corporation

Agricultural Chemical Group
1701 East Patapsco Avenue Box 1616
Baltimore Maryland 21203
(301) 355 6400

ORIGINAL
(Red)

FMC

January 6, 1984

Mr. Lou Martino
Office of Environmental Programs
Waste Management Administration
201 W. Preston Street
Baltimore, Maryland 21201

CERTIFIED MAIL
RETURN REQUEST REQUESTED

Dear Mr. Martino:

As agreed at our meeting in November, 1983, this letter sets forth the remediation plan for the existing Pounce Surge Pond located at the FMC Baltimore plant.

A sampling program will be implemented to determine the chemical composition of any remaining material and the clay lining. The sampling program will insure that a proper closure plan is formulated and implemented. When the sampling and subsequent analyses are completed, a formal closure plan will be forwarded to you for your review as previously agreed.

A carbon steel tank will be installed to replace this existing facility in the vicinity of the Pounce Process Area. Removal of the existing impoundment from service will not delay installation of the new tank.

The proposed project schedule for the tank and associated equipment is as follows:

		Date
a.	Equipment Bids	January 6, 1984
b.	Equipment Ordered	One week after bids received
c.	Foundation Installation	February 29, 1984
d.	Piping Complete	March 17, 1984
e.	Project Complete	March 31, 1984

Replacement of the present Pounce Surge Pond with a tank will remove this facility from the requirements as a facility included under the Baltimore Plant's Controlled Hazardous Substance (CHS) Permit.

RECEIVED
SRA
WT DIVISION

ORIGINAL (Red)

A print is enclosed showing the details of the tank location and associated equipment.

If you have any questions, please contact C. Shaheen or myself.

Sincerely,

D. W. Palmer
Environmental Manager

DWP:ct

[redacted]ion

FACILITY INFORMATION

ORIGINAL (Red)

Facility Name: FMC Corporation

ID#: MDD003071875

Location: 1701 East Patapsco Avenue, Box 1616, Balto., Md. 21203

TSD Activities: CHS treatment/storage facility

1. Has a specific G.W.M. Inspection been performed at this site? Yes _____ No _____ If Yes, when? May, 1983 If No, is an inspection scheduled? Yes _____ No _____ If Yes, when? _____

2. Have G.W.M. Wells been installed at this site? Yes X No _____ If No, what Corrective Actions have been taken or are scheduled? _____

3. Are the Wells located properly? Yes X No _____ If No, what Correcti Actions have been taken? _____

Are they constructed properly? Yes X No _____ If No, describe Actions taken. _____

Is a State Permit required to install G.W. Wells? Yes X No _____ If Yes, does site have such a permit? Yes X No _____ If Yes, pleas describe. _____

If No, what Corrective Actions have been taken or are contemplated? _____

ORIGINAL (Red)

4. Number of Wells being sampled & analyzed for G.W.M.: Upgradient 4
Downgradient 10 Number of other wells on site 2

5. Has the Quality of the Wells been checked for such things as consistency of depth, possible silting, etc.? Yes X No _____ Any problems found? Yes _____ No X If Yes, describe. _____

_____

6. Has facility developed a sampling and analysis plan in accordance with 40 C.F.R. 265.92 or analogous State regulations? Yes X No _____ If Yes, have you reviewed the plan? Yes X No _____ Does it meet the RCRA requirements? Yes X No _____. If No, what actions have been taken or are contemplated? _____

_____

7. Has facility completed sampling and analysis for the initial background year for the IPDWS? Yes X No _____; the parameters establishing groundwater quality? Yes X No _____; the parameters used as indicator of groundwater contamination? Yes X No _____. If any of the above answers is No, please describe what Corrective Actions have been taken or are contemplated. _____

_____

Has facility reported this data to you? Yes X No _____ If No, describe Corrective Actions taken. _____

_____

ORIGINAL
(Red)

Have you checked QA/QA for the gathering of this initial Background Data?

Yes X No _____ If No, describe any plans for such a review. _____

_____

8. Has any contamination (e.g., exceedances of MCLs) been reported in the Background Data? Yes X No _____ If Yes, is this contamination affecting any public or residential Drinking Water Supplies or Potable Aquifers? Yes _____ No X If Yes, describe Corrective Actions taken. _____

_____

Describe the contamination (types and amounts). Arsenic .347, barium 7.85 Cr .39 HG.0054, Gross alpha (p Ci/l) 50+19, Selenium 7.41

Describe local GW use. None

_____

9. Is the facility up to date with the sampling and analysis as required by 40 C.F.R. 265.92? Yes X No _____ If No, describe where they are and why. _____

_____

What action is contemplated? _____

_____

10. Has facility performed the Student-T test? Yes X No _____ If No, describe what action has been taken or is contemplated. _____

_____

ORIGINAL (Red)

If Yes, was any Significant Increase (or Decrease in the Case of pH) present? Yes X No _____ If Yes, has facility switched to a Quality Assessment Program? Yes X No _____. If No, describe what course of action is underway. _____

If Yes, please describe the plan. placement of additional wells, determination of GW flow patterns, mass balance of contaminates.

Has the facility submitted this plan to you as required? Yes X No _____ If No, what Actions are contemplated? _____

If the facility hasn't switched to a Quality Assessment Program, do they have a Quality Assessment outline? Yes X No _____ If No, what Actions have been taken or are contemplated? _____

Have you verified the findings of the Student-T analysis? Yes X No _____

11. Is the data received from facility being entered into a Computer Data Base like Storet? Yes _____ No X If Yes, explain. _____

If No, describe what type of manual system is used and how effective it is. pencil-paper - satisfactory

12. Additional State Comments or Concerns: _____

FMC Corporation

Agricultural Chemical Group
1701 East Patapsco Avenue Box 1616
Baltimore Maryland 21203
(301) 355 6400

ORIGINAL
(Red)

FMC

June 9, 1983

Mr. Fredric L. Sachs, Chief
Hazardous Waste Division
State of Maryland
Office of Environmental Programs
201 West Preston Street
Baltimore, Maryland 21201

Dear Mr. Sachs:

In response to your letter of May 20, 1983, we are forwarding preliminary information you have requested which has been collected to date and are, at this time, involved in a detailed investigation concerning the Retention Basin.

As you may know, we initiated the investigation based on our observation of cracks in the concrete Fabriform apron over-lying the sloping walls of the Basin. Constructed in 1976 as a part of the Plant III 7-Hydroxy expansion project, the Basin collects rainfall in the entire 7-Hydroxy production area via a hydraulic sewer system and diversion box at the time of heavy-excess flow. Designed for a capacity of approximately one million gallons, the Basin was clay lined and covered with gravel erosion protection on the sloping walls. (original prints and material specs are attached). In 1978 following periods of heavy rain slumping of the side walls was noted at several locations. To remedy the situation the interior slopes were recontoured, additional clay added, surrounding perimeter roads drained and paved and the concrete Fabriform apron placed atop the sloping walls. (See attached literature on Fabriform - Erosion Control Mats)

Since that time we have experienced no problems until the cracks appeared, and although we do not agree as stated in your letter that "such a condition represents a serious deterioration in (the) functional integrity", we would agree that such a condition warrants the investigation we have initiated. We have retained Hardin Associates, Inc. of Pasadena, Maryland to begin an evaluation as to the cause for the cracks in the Fabriform. Their initial work, as your staff is aware, has consisted in part of test borings and well construction in the Basin. Preliminary test borings recently available from Hardin's work are attached. We have also retained O'Brien and Gere Engineers Inc. of Syracuse, New York to work with Hardin Associates and report their findings and recommendations. We feel that the broad engineering and hydrogeologic skills of these two firms as well as their experience in the field of environmental management represents a sound approach in evaluating all aspects of the project.

ORIGINAL
(Red)

At this time we anticipate receiving a report from these firms by June 29, 1983 and it is our intent, as you requested, to share this information with you. Please rest assured we have every intention of pursuing the investigation quickly and, should problems be discovered, correcting them in a sound and expeditious manner.

We will contact you as soon as the report is received from our consultants and, if you are amendable, arrange a meeting. We trust that this information contained herein is satisfactoty in complying with the seven day and ten day suspence dates set forth in your letter.

Should you have any questions, please do not hesitate to contact me.

Sincerely yours,

Darryl W. Palmer

Darryl W. Palmer
Environmental Manager

DWP:ct

cc: Mr. Lou Martino
[redacted]

Enclosures:
Drawing No. A-21155 Rev. 2
Drawing No. A-21001 Rev. B
Specification No. 35420-2100-00-93
Specification No. 35420-1400-00-67
Preliminary Hardin Boring Records
Brochure on Fabriform

ORIGINAL (Red)

STATE OF MARYLAND — DEPARTMENT OF HEALTH AND MENTAL HYGIENE

MEMORANDUM

Copies

THRU William E. Chicca
Fredric L. Sachs

TO John Koontz **From** Lou Martino **Date** 3/11/83

Subject FMC Corp. (A023)

Please find with this memo an attachment titled Table 1 which summarizes TOTAL ORGANIC HALOGEN (TOH) monitoring well data from groundwater at FMC. The table reports data from 3 separate hazardous waste handling areas. Two of these areas, the Retention Pond and the Surge Pond are CHS surface impoundments. The remaining area is a disposal site last used in 1975 termed the Inactive Disposal Site. Figures 1, 2 and 3 show these hazardous waste handling areas and the relative position of the wells used to monitor groundwater in each area. Figure 4 is the only information I have concerning the wastes which were disposed in the Inactive Disposal Site.

A comparison of TOH levels in the upgradient and downgradient wells for each site strongly suggests that constituents are being introduced to the groundwater by the Inactive Disposal Site and Surge Pond. The TOH levels from MW10 (upgradient well) and MW16 for the Retention Basin approach the levels recorded in MW13, while corresonpondingly high levels of TOH were not detected in other wells that parallel the shoreline downgradient from the Inactive Disposal Site and Retention Basin (MW15, 14, 17 and 27). This strongly suggests that constituents are migrating from the Inactive Disposal Site to Curtis Bay along the line MW13, 10 and 16. I have discounted the data from MW15 because 4 quarters of groundwater surface elevation (GWSE) determinations have consistently shown this well to have higher GWSE than the upgradient well - MW13. However, this anamolous water level and the TOH values detected in MW15 raises questions concerning the groundwater quality and hydrogeology of that portion of the FMC plant.

My major concern is with the Inactive Disposal site. FMC is forced by regulation to retrofit the Surface Impoundments with leachate detection collection and removal systems or provide a double liner system. Compliance with the Surface Impoundment regulations will remove the groundwater contamination source. I am not confident that the CHS regulatory framework exists to adequately address the potential contamination resulting from the Inactive Disposal site. I requested FMC to conduct a samling and analyses study for the 2 Surface Impoundments to identify the individual chemical species which are expressed as TOH. Some of this data has been submitted and is included with this memo as Tables 2 and 3. More data is forthcoming; however, FMC has indicated that they are experiencing difficulty in accounting for the TOH levels observed. Though I did not include the Inactive Disposal site in this TOH assessment, it is likely that FMC would experience difficulty in accounting for the TOH levels in MW12 through 15 as well. FMC has made a commitment (telephone communication - Palmer/Martino, 2/25/83) to continue to attempt to identify the TOH chemical species.

ORIGINAL
(Red)

I recommend that the WMA Support Services initiate a sampling and analyses plan to identify priority pollutants, Appendix V hazardous consituents (COMAR 10.51) and or other pollutants. This assessment should be performed for all the wells listed in Table 1. However, I would prioritize the sites to be examined as follows: Inactive Disposal Site, Retention Basin, and Surge Pond. Data generated by this assessment should be used by the WMA to establish an administrative position concerning the Inactive Disposal Site, the Surge Pond, and the Retention Basin.

Please be aware that the Groundwater Plan for the FMC Inactive Disposal site indicates the following: "details regarding the location and/or type of future monitoring, if necessary, must be left unresolved at present and await the completion of this study." The study is completed so a notification of further activities pertaining to the Inactive Disposal Site is expected. Please contact me for any additional information.

sml

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MAR 27 1983
ENFORCEMENT DIVISION

TABLE I

TOH Reported in mg/l

Retention Basin	1st quarter	2nd quarter	3rd quarter	4th quarter
UGMW10	91, 96, 110, 113	89, 95, 96, 98	77.7, 77.5, 81.3, 75.2	84.1, 89.8, 79.8 72.8 - 85.2
MW16	16	100	113	114
MW27	7.9	12	11.2	12.2
MW17	22	25	14.4	29.9
Surge Pond				
UGMW24	.04, .05, .03, .06	.04, .05, .03, .03	.32, .20, .08, .20	.033, .027, .024, .033
MW25	33	32	13.9	48.9
MW23	6.0	4.7	3.8	4.9
MW22	19	12	12.8	27.3
Inactive Disposal Site				
UGMW12	3.9 - 3.3, 3.7 - 3.8	3.5	1.91 - 3.77, 2.10 - 3.86	2.58, 2.79, 2.55 2.94
UGMW12A	4.5	4.7	6.80	5.24
MW13	170	210	152	194
MW13A	2.2	2.0	3.65	1.57
MW14	9.7	6.9	7.38	5.07
questionable well MW15	54	120	9.89	9.23

sml

ORIGINAL (Red)

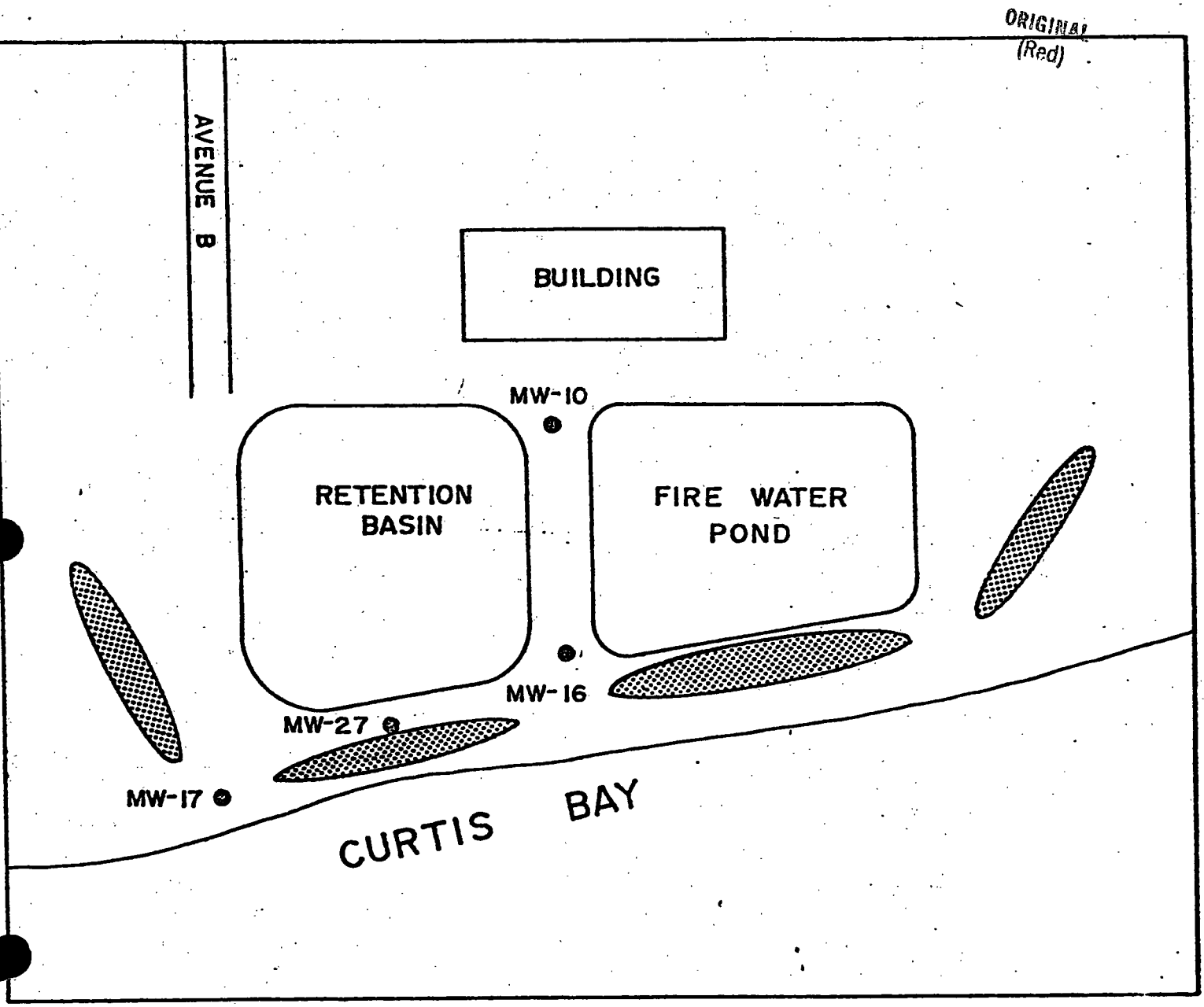

Figure 1. Monitor-well locations

GERAGHTY MILLER GW PLAN MARCH 82

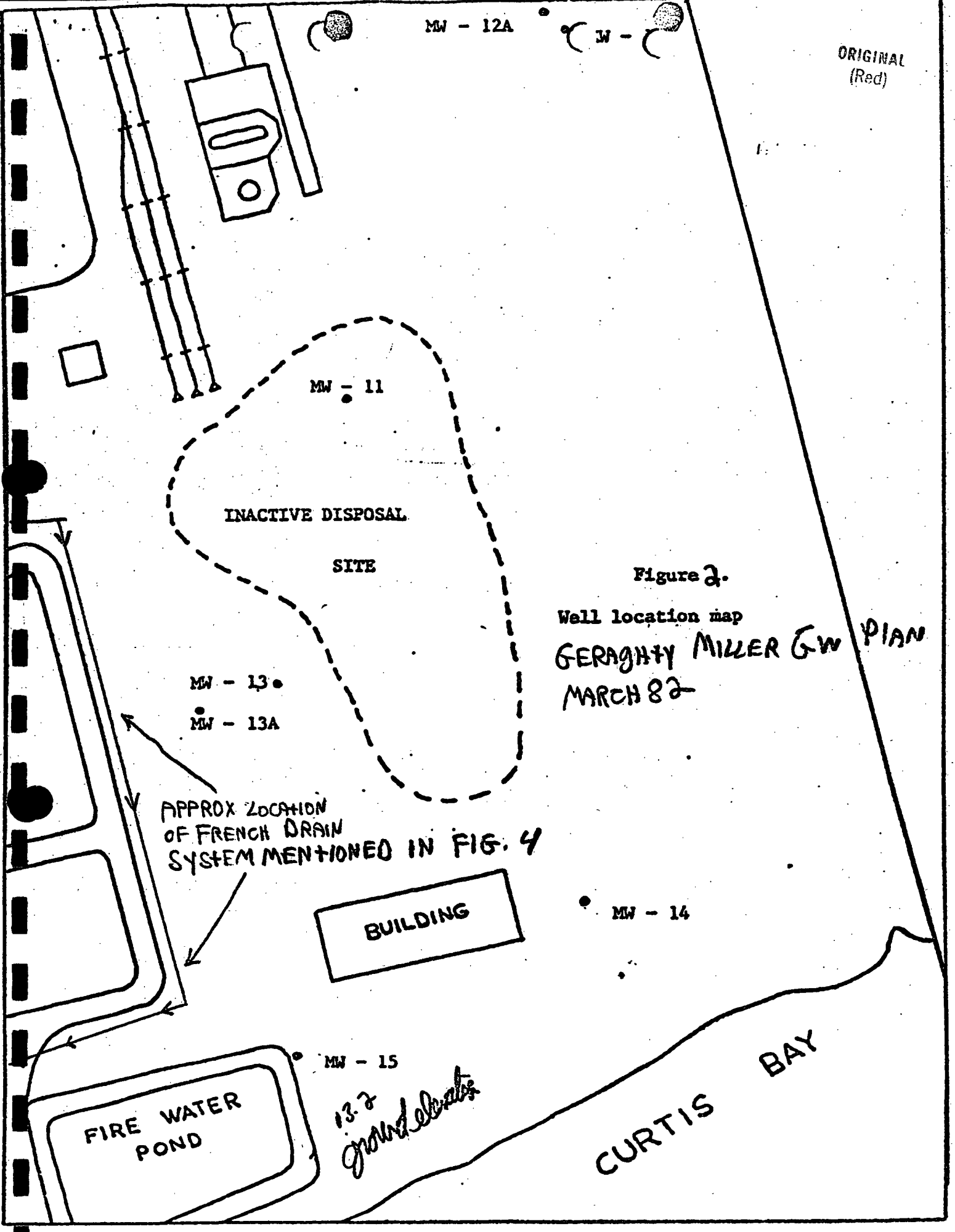

Figure 2.

Well location map

GERAGHTY MILLER GW PLAN
MARCH 82

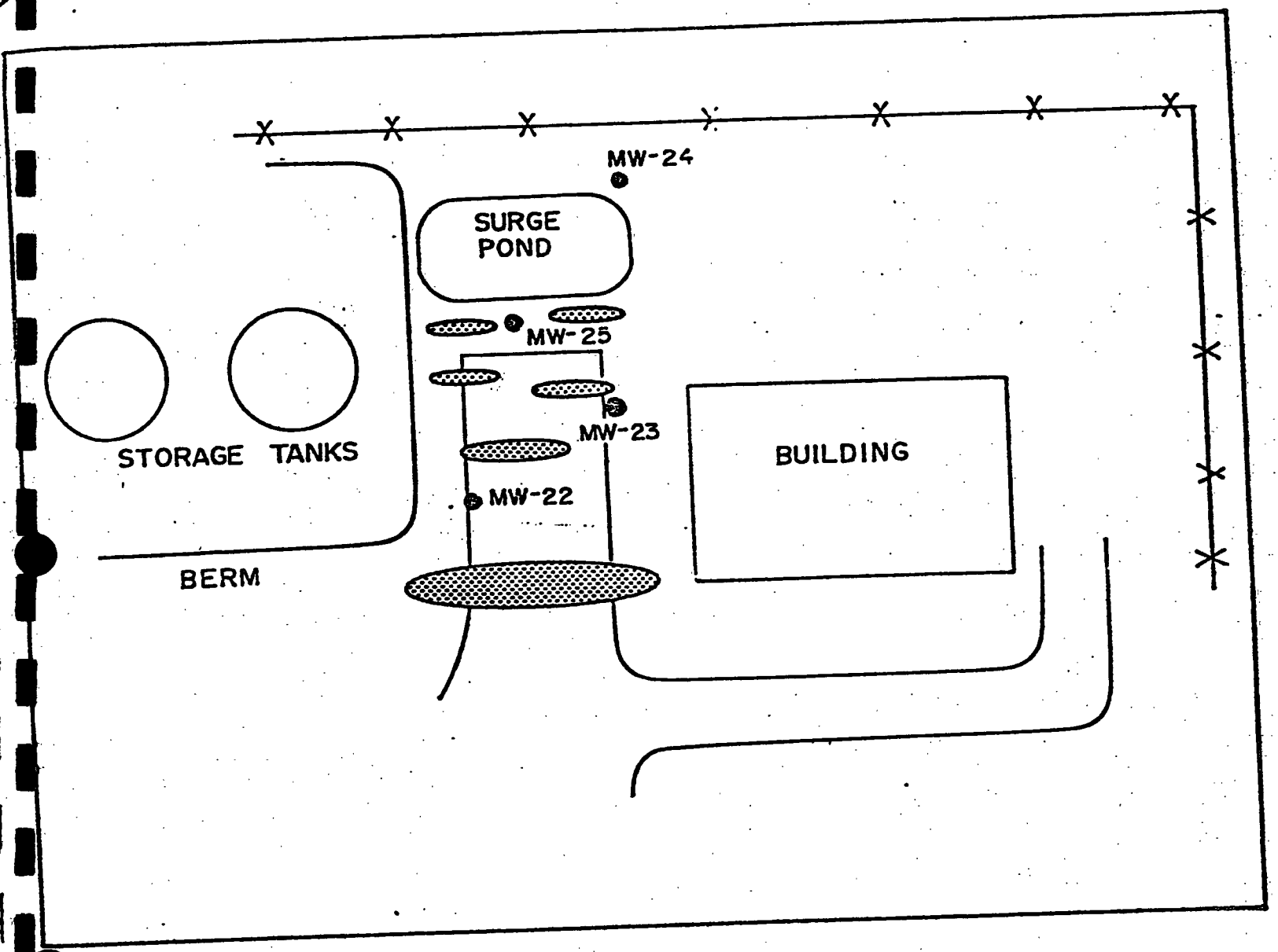

Figure 3. Monitor-well locations

GERAGHTY MILLER GW PLAN MARCH 82

FMC Corporation
Agricultural Chemical Division
1701 East Patapsco Avenue Box 1616
Baltimore Maryland 21203
(301) 355 6400

FIGURE 4

ORIGINAL (Red)

December 19, 1978

FMC

State of Maryland
Water Resources Administration
Industrial and Hazardous Substances Division
Tawes State Office Building
Annapolis, Maryland 21401

Attention: Mr. William E. Chicca

Dear Mr. Chicca:

As required by the Special Conditions section of the FMC Baltimore plant Facility Permit No. A023, a report on the quantity and nature of materials disposed in the abandoned dump site is submitted.

Sometime prior to 1925, this landfill area was dug out to form a holding area for molasses slop. This molasses slop was a material of process under U. S. Industrial Alcohol Co., Inc., resulting from the manufacture of alcohol from Cuban molasses. The slop was stored in tanks and in this reservior, unitl it could be processed into a potash type fertilizer.

After USI went out of this alcohol-from-molasses business during World War II, this pond was dried up leaving a low spot in the land. During the middle 1940's, landfilling of this area began. This landfill operation had continued sporadically until mid 1975. At this time, dumping operations were terminated.

The wastes generated from operations that no longer exist, and the estimated amounts that were dumped in this area are listed below.

Material	Estimated Amount, lbs.
Acetoacetarylides dryer scrap	1,000,000
Carbamate residues	400,000
Pyrethrum flower residues	20,000
Pilot Plant wastes	10,000

In addition, the following wastes that are currently generated, but now disposed via contract waste and the estimated amounts that were dumped in this area are listed below.

Material	Estimated Amount, lbs.
7-Hydroxy Tar	3,000,000
7-Nitro Centrifuge bottoms	3,000,000
Ethion® filter aids and filter tubes	40,000
Butacide® tar	2,000,000
Dapon® gel and polymerized monomers	2,000,000
General trash and debris	30,000,000

ORIGINAL
(Red)

It should be noted that above lists are the best estimates of the materials which constitute the major proportion of the present dump. In the fifty years of plant operation which have included numerous small production campaigns, small amounts of material may have been dumped at this location which are not included in the above estimate.

It should also be noted that the 7-OH plant III is located on one segment of the former dump site. Materials excavated during the construction of 7-OH plant III were removed to the Solley Road landfill in 1975 and 1976. The plant dump was formally closed in July 1975 and earth fill placed atop it. Surface waters from this former dump site now flow into the plant waste water systems using outfall 001. A "french drain" system just southwest of the former dump site was installed in 1976 to collect any leachate in this area. This drainage system ties into the 7-Hydroxy sewer system.

Please call if there are any questions.

Sincerely,

J. H. Convey

J. H. Convey
Environmental Manager

cc - R. T. Sebrosky
M. J. Gross
R. N. Mesiah - Phila.

ORIGINAL
(Red)

TABLE II

FMC Corporation - Baltimore, Maryland
Third Quarter - 1982

Groundwater Monitoring Data
(Surge Pond)

Total Organic Halogen Species Analysis (ug/l)

Well #24	
methylene chloride	55.7
chloroform	2.9
1,1,2,2-tetrachlorethene	3.4
chlorobenzene	430.8
Well #25	
methylene chloride	55.4
chloroform	336.9
1,2-dichloropropane	349.2
1,1,2-trichloroethane	12.5
1,1,2,2-tetrachloroethene	27.1
chlorobenzene	>3276.7
Well #23	
methylene chloride	54.9
chloroform	10.9
1,1,2,2-tetrachloroethene	4.5
chlorobenzene	>3276.7
Well #22	
methylene chloride	77.6
chloroform	151.6
1,2-dichloropropane	311.9
1,1,2-trichloroethane	12.6
1,1,2,2-tetrachloroethene	9.0
1,1,2,2-tetrachloroethane	6.2
chlorobenzene	>3276.7

TABLE III

ORIGINAL (Red)

FMC Corporation - Baltimore, Maryland
Third Quarter - 1982

Groundwater Monitoring Data
(Retention Basin)

Total Organic Halogen Species Analysis (ug/l)

Well #10

methylene chloride	520.7
chloroform	5.5
1,1,2,2-tetrachloroethene	3.5
chlorobenzene	109.4

Well #16

methylene chloride	48.5
chloroform	2.4
trans-1,3-Dichloropropene	48.6
1,1,2,2-tetrachloroethene	3.7
chlorobenzene	1204.0

Well #27

methylene chloride	12.9
chloroform	5.1
chlorobenzene	6.4

Well #17

methylene chloride	120.6
trans-1,2-dichloroethylene	8.2
chloroform	33.0
trans-1,3,dichloropropene	241.8
cis-1,3-dichloropropene	37.0
1,1,2-trichloroethane	46.1
1,1,2,2-tetrachloroethene	6.5
chlorobenzene	7.8

ORIGINAL (Red)

FMC 27

elev. 11.5

Boring depth: 20.5 feet
Screen setting: 15.5 - 20.5 feet

Depth (ft)	Thickness (ft)	Description
0.0- 3.0	3.0	Fill, sand, fine to medium and gravel, grayish brown
3.0- 5.0	2.0	Sand, fine, silty, little clay, black
5.0-10.0	5.0	Sand, fine, little tan and brown silt, black, odor
10.0-13.5	3.5	Silt, little fine sand, black, gray, tan, and orange, odor, moist
13.5-20.5	7.0	Silt, some clay, brown and gray, trace reddish brown

ORIGINAL (Red)

PMC 25

abv. 26.36

Boring depth: 21 feet
Screen setting: 15 - 20 feet

Depth (ft)	Thickness (ft)	Description
0.0- 7.5	7.5	Sand, fine to medium, micaceous, silty, odor, brown and gray, wet
7.5-12.5	5.0	Silt and fine sand, very clayey, lot of iron stains, odor, reddish-brown to gray
12.5-16.5	4.0	Clay, saturated, very plastic, gray
16.5-21.0	4.5	Sand, fine to coarse, silty, clayey, micaceous, gray to dark gray, wet

ORIGINAL (Red)

FMC 24

elev. 30.58

Boring depth: 26 feet
Screen setting: 21 - 26 feet

Depth (ft)	Thickness (ft)	Description
0.0-12.5	12.5	Sand, fine to medium, silty, some clay, some layering, coarse sand lens, iron stains, reddish-brown and gray, damp to moist
12.5-17.5	5.0	Clay, silty, soft, very plastic, gray
17.5-26.0	8.5	Sand, medium to coarse, poorly sorted, silty, some fine sand, dark gray, wet

ORIGIN..
(Redi

FMC 23

elev. 29.31

Boring depth: 21 feet
Screen setting: 17 - 22 feet

Depth (ft)	Thickness (ft)	Description
0.0- 4.5	4.5	Silt, sandy, clayey, some gravel, some vegetation, micaceous, brown and gray
4.5- 7.5	3.0	Sand, medium, well sorted, brown with some black and gray streaks,, wet
7.5-12.5	5.0	Silt, sandy, clayey, micaceous, slight odor, gray and reddish-brown, damp
12.5-14.5	2.0	Sand, medium, well sorted, dark gray, wet
14.5-17.5	3.0	Clay, saturated, soft, plastic, gray
17.5-21.0	3.5	Sand, coarse, poorly sorted, off white to gray, wet

ORIGINAL
(Red)

FMC 22

clay 26.06

Boring depth: 21 feet
Screen setting: 15 - 20 feet

Depth (ft)	Thickness (ft)	Description
0.0- 6.5	6.5	Sand, fine to medium, silty, some gravel, micaceous, slight odor, brown to reddish-brown with some gray, wet
6.5- 9.5	3.0	Silt, clayey, some fine sand, micaceous, gray with brown swirls, wet
9.5-12.5	3.0	Silt and fine sand, coarse sand lens, clayey, layered, micaceous, iron stains, reddish-brown with gray swirls, moist to wet
12.5-14.5	2.0	Clay, soft, plastic, gray
14.5-21.0	6.5	Sand, fine , silty, micaceous, gray to dark gray, wet

ORIGINAL
(Red)

FMC 17

10.82

Boring depth: 21 feet
Screen setting: 15 - 20 feet

Depth (ft)	Thickness (ft)	Description
0.0- 7.5	7.5	Sand and gravel, tan to brown
7.5- 9.0	1.5	Sand, medium, odor, grayish-black
9.0-15.0	6.0	Clay, silty, gray with reddish-brown swirls
15.0-17.5	2.5	Sand, fine, reddish-brown
17.5-21.0	3.5	Clay, medium dense, gray with reddish-brown lenses, moist

ORIGINAL (Red)

FMC 16

elev. 11.08
Boring depth: 21 feet
Screen setting: 15 - 20 feet

Depth (ft)	Thickness (ft)	Description
0.0- 1.5	1.5	Gravel and sand, gray
1.5- 7.5	6.0	Clay, medium dense, some sand lenses, red with white swirls
7.5-16.0	8.5	Sand, fine, silty, some gravel, odor, brown to black, wet
16.0-21.0	5.0	Clay, silty, medium dense, plastic, micaceous, gray to black, wet

ORIGINAL
(Red)

FMC 15

elev. 14.83

Boring depth: 21 feet
Screen setting: 15.5 - 20.5 feet

Depth (ft)	Thickness (ft)	Description
0.0- 2.5	2.5	Silt, gravel, surface debris, brown, wet
2.5- 7.5	5.0	Sand, medium, some gravel, piece of brick, odor, black, wet
7.5-21.0	13.5	Clay, silty, medium dense, plastic, odor, reddish-brown to gray

ORIGINAL
(Red)

FMC 14

elev 16.12

Boring depth: 21 feet
Screen setting: 15 - 20 feet

Depth (ft)	Thickness (ft)	Description
0.0- 2.5	2.5	Silt, gravel, surface debris, pieces of wood
2.5- 7.5	5.0	Silt, very clayey, some sand and gravel, brown with gray
7.5- 9.0	1.5	Clay, soft, gravel, gray, moist
9.0-17.5	8.5	Sand, medium to coarse, some odor, dark gray, reddish-brown and brown, wet
17.5-21.0	3.5	CIay, sIightIy silty, brown organic lenses, some iron stains, medium dense, gray

ORIGINAL
(Red)

FMC 13A

elev. 18.0

Boring depth: 39.5 feet
Screen setting: 34 - 39 feet

Depth (ft)	Thickness (ft)	Description
23.0-32.5*	9.5	Clay, silty, dense, very plastic, gray with brown
32.5-39.5	7.0	Sand and gravel, coarse, slight odor, brown, wet

*Note: See log of FMC 13 for descriptions from 0 to 23 feet.

ORIGINAL
(Red)

FMC 13

elev. 17.45

Boring depth: 21 feet
Screen setting: 15 - 20 feet

Depth (ft)	Thickness (ft)	Description
0.0- 2.5	2.5	Silt, sand, some gravel, brown
2.5- 7.5	5.0	No recovery
7.5-12.5	5.0	Clay and silt, some gravel, sandy, odor, black, wet
12.5-14.0	1.5	Sand, medium, brown and gray, wet
14.0-23.0	9.0	Clay, sand lens, medium dense, odor, gray with brown swirls, moist

ORIGINAL
(Red)

FMC 12A

elev. 19.56

Boring depth: 40.5 feet
Screen setting: 34 - 39 feet

Depth (ft)	Thickness (ft)	Description
23.0-32.5*	9.5	Clay, silty, few white cinder-like blebs, dark gray
32.5-34.0	1.5	Sand, fine, very silty, few black blebs, light gray, damp
34.0-37.5	3.5	Silt, clayey, white sand lenses, brown
37.5-40.5	3.0	Gravel, clay, sand and silt, brown and white, moist

*Note: See log of FMC 12 for descriptions from 0 to 23 feet.

ORIGINAL
(Red)

FMC 12

dat. 19-56

Boring depth: 21 feet
Screen setting: 14 - 19 feet

Depth (ft)	Thickness (ft)	Description
0.0- 7.5	7.5	Silt and clay, some vegetation, brown to black
7.5-10.0	2.5	Clay, silty, medium dense, micaceous, brown and gray with reddish streaks
10.0-12.5	2.5	Sand, fine to medium, some silt, iron stains, micaceous, wet
12.5-14.5	2.0	Silt and fine sand, light brown, moist
14.5-23.0	8.5	Clay, silty, micaceous, lenses of platy iron running horizontally, medium dense, some layering, plastic, off white to dark gray, some reddish swirls

ORIGINAL
(Red)

FMC 11

Boring depth: 21 feet
Screen setting: 14.5 19.5 feet

Depth (ft)	Thickness (ft)	Description
0.0- 2.5	2.5	Sand, gravel, silt and clay, odor, brown
2.5- 7.5	5.0	Clay, silty, black
7.5-12.5	5.0	Silt, clayey, odor, black, moist
12.5-17.5	5.0	Sand, fine, silty, clayey, odor, black, wet
17.5-21.0	3.5	Silt and clay, micaceous, sludge-like lens, some vegetation stringers, few iron stains, gray with brown splotches

ORIGINAL
(Red)

FMC 10

elev. 10.9

Boring depth: 21 feet
Screen setting: 15 - 20 feet

Depth (ft)	Thickness (ft)	Description
0.0- 7.5	7.5	Sand, silt and clay, some gravel, piece of wood, odor, gray and black
7.5-12.5	5.0	Sand, medium to coarse, little silt, odor, black, wet
12.5-17.5	5.0	Silt, sandy, clayey, soft, lot of vegetation and wood, odor, dark gray to black, moist
17.5-21.0	3.5	Sand, fine, silty, clayey, micaceous, odor, soft, dark gray, moist to wet

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